L1: Entry 2 of 3 File: USPT Mar 26, 2002

DOCUMENT-IDENTIFIER: US 6363060 B1
TITLE: Method and apparatus for fast WCDMA acquisition

Brief Summary Text (14):
The group identification is provided to SSC outer coder 2. The group identification is mapped to one of 32 possible 16 element code words wherein each of the elements takes on one of seventeen possible values. The code words are selected as comma free codes such that any cyclic shift of any of the code words results in a vector that is not a legitimate code word. The elements of the code word are then provided to SSC inner coder 3 which maps each of the elements of the code words into a 256 chip sequence. Each of the possible 256 chip SSC sequences into which an element of the code word can be mapped is orthogonal to any other sequences used to encode an element of a code word. Each of the possible 256 chip SSC sequences is also orthogonal to the 256 chip sequence used by the PSC. Each of the sixteen 256 chip SSC sequence is added to the PSC sequence punctured into the first 256 chips of part 1 of the slots in each frame.

Brief Summary Text (26):
SSC outer decoder 24 converts the sequence estimates to code word elements (c.sub.1, c.sub.2, . . . , c.sub.17) and then compares the resulting code word to all legitimate code words and all cyclic-shifted versions of those legitimate code words. Upon selection of the most likely transmitted code word, the SSC Outer decoder has detected the frame timing and has decoded the group identification (GI) of the base station.

Detailed Description Text (18):
At step 110, PSC.sub.1 is compared with new estimate PSC.sub.3. If PSC.sub.1 is equal to PSC.sub.3, then PSC.sub.1 is deemed valid for use in slot timing. If PSC.sub.1 is deemed valid, then SSC.sub.1, which based its slot timing on PSC.sub.1, is evaluated and tested for validity in step 112. In an exemplary embodiment, the SSC validation in step 112 is based on the number of SSC symbol errors detected during the formation of SSC.sub.1. These symbol errors are measured by counting the number of symbols decoded during the first stage of SSC decoding which do not agree with the symbols of the nearest SSC code word decoded in the second stage. If this number of symbol disagreements (also called Hamming distance) is greater than a predetermined value, SSC.sub.1 is deemed invalid. In another embodiment of the invention, step 112 uses a combination of Hamming distance and the correlation energies of the decoded SSC symbols to determine whether the confidence level of a SSC decoding rises to the level required for validity. If SSC.sub.1 is deemed valid in step 112, then PILOT.sub.1 is used as an estimate of pilot offset in step 114.

Detailed Description Text (58):
SSC symbol correlator 404 generates decoded SSC symbols and provides them to SSC decoder 406. When SSC decoder 406 has been provided with one SSC symbol for each slot in a frame period, SSC decoder 406 performs block decoding of the SSC code word to determine group identification (GI) and frame timing. As discussed above, WCDMA uses a comma-free SSC code, which enables the identification of slot position within a frame from the symbols of the decoded SSC code word. The decoded SSC code word also uniquely identifies the one of sixteen group identification (GI) values for use in subsequent pilot channel decoding. Both the frame timing signal and GI generated by SSC decoder 406 are provided to pilot detector 210.

CLAIMS:

23. The method of claim 20 wherein said validity test comprises measuring the

Hamming distance between said set of SSC code symbols and the nearest cyclic shift of a valid SSC code word, and comparing said Hamming distance to a predetermined maximum allowable Hamming distance.